REMARKS

Upon entry of this amendment, Claims 1, 5-11, and new Claim 18 constitute the pending claims in the present application. Among them, Claims 7 and 10 are directed to non-elected species, and are withdrawn from further consideration.

Applicant has amended Claim 1 and added new Claim 18 to further clarify the subject matter claimed. Support can be found throughout the specification. *See, e.g.*, the last three paragraphs on page 1 (also see below).

Applicant respectfully requests reconsideration in view of the following remarks. Issues raised by the Examiner will be addressed below in the order they appear in the Office Action.

Claim Rejections under 35 U.S.C. § 102(e)

Claims 1, 5, and 6 stand rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by WO 03/097011 A1 ("Barth").

The Office Action acknowledges that the Rule 131 Declaration filed on June 13, 2008 is sufficient to overcome the rejection of Claims 8, 9, and 11 with respect to Prevacid™ (lansoprazole). The Office Action, however, argues that Barth still anticipates the broader Claims 1, 5, and 6, because Barth purportedly teach the treatment of *partial nocturnal upper airway obstruction* in a condition known as "obstructive hypopnea" (page 8, lines 9-14 of Barth). Although the Examiner acknowledges Applicant's arguments in the August 20, 2007 response that OSAS and primary snoring are two distinct disease conditions, the Office Action insists that Applicant has not "distinguished the instant claims (*i.e.* treating partial nocturnal upper airway obstruction) from the teaching of Barth *et al.* (*i.e.* treating partial obstruction of the patient's airway (in hypopnea))."

Applicant has amended Claim 1 and added dependent Claim 18 to further clarify the subject matter claimed. Applicant submits that at least the amended claims exclude the treatment of patients having apnea or hypopnea, as purportedly disclosed by the cited art. Thus, the presently claimed invention is not anticipated by the cited art.

The last three paragraphs on page 1 of the instant specification teach that snoring is a "nocturnal upper airway obstruction" that produces a sound "caused by soft tissue movement of the throat during sleep." The specification distinguishes snoring with "a more pronounced collapse or obstruction (of the upper airway)" based on whether the obstruction causes hypoxia (*i.e.*, deficiency in oxygen) to the body, especially hypoxemia (*i.e.*, deficiency in the concentration of dissolved oxygen in blood).

Although the specification as filed supports the treatment of primary snoring patients as well as patients having "sleep apnea and other forms of sleep disordered breathing," (*see* 2nd paragraph of page 1), Claim 1 as currently amended is directed to treating primary snoring patients. Dependent Claim 18 further clarifies that the patient population to be treated specifically excludes sleep apnea patients. This is at least implicitly supported by the first page of the specification since it distinguishes "snoring" from "sleep apnea" and other "more pronounced collapse or obstruction" especially OSAS.

As one of skill in the art will appreciate, and as Applicant will present evidence below, the distinguishing characteristic of apnea or hypopnea is **the reduction of blood oxygen levels (hypoxemia)** due to the severe breathing disorders (such as prolonged breath stoppage) in these conditions. Loud as it may sound, primary snoring (those not associated with apnea or hypopnea) does not cause **reduction of blood oxygen levels or hypoxemia**, as taught by the instant specification (*supra*).

To support this position, Applicant submits herewith **Exhibit A**, which is a Wikipedia entry about **Hypopnea**. It defines hypopnea as "a medical term for a disorder which involves episodes of overly shallow breathing or an abnormally low respiratory rate. This differs from apnea in that there remains some flow of air. Hypopnea events may happen while asleep or while awake. During sleep, hypopnea is classed as a sleep disorder. ... The disruption in breathing causes a drop in blood oxygen level, which may in turn disrupt the stages of sleep. Daytime hypopnea events are mostly limited to those with severely compromised respiratory muscles, as occurs in certain neuromuscular diseases. Similarly, daytime hypopnea can also cause a drop in blood oxygen level" (emphasis added). Thus, **hypopnea is characterized by a drop in blood oxygen level resulting from the breathing disorder.**

This conclusion is further supported and quantified under the heading "General Information," which states that "[i]n the context of diagnosis and treatment of sleep disorders, a hypopnea event is not considered to be clinically significant unless there is a 50% (or greater) reduction in flow and an associated 3% (or greater) desaturation in the person's O_2 levels for 10 seconds or longer, or if it results in arousal or fragmentation of sleep. The direct consequence of hypopnea (as well as apnea) is that the CO_2 in the blood increases and the oxygen level in the patient's blood decreases proportionate to the severity of the airway obstruction" (emphasis added). This appears to match the definition in Gould as cited by the Office Action. Applicant further notes that Gould also emphasizes the level of "(4% O_2) desaturation" in the apnea / hypopnea patients enrolled in the study.

Consistent with this, obstructive hypopnea only differs from obstructive apnea in that "the airway is only partially close." "However, this closure is still enough to cause a physiological effect (*i.e.*, an oxygen desaturation and/or an increase in breathing effort terminating in arousal)" (emphasis added). This suggests that oxygen desaturation in the blood (hypoxemia) is a common characteristic between hypopnea and apnea.

Not surprisingly, the **severity of hypopnea** is measure by "hypopnea index (HI)," and the combined severity of hypopnea and apnea is measured by "apnea-hypopnea index (AHI)" that "... gives an overall severity of sleep apnea including sleep disruptions and desaturations (a low level of oxygen in the blood)" (emphasis added). Applicant notes that Xiao also measured AHI in the patients enrolled in the study.

Similarly, the **symptoms** of hypopnea includes "reduced levels of oxygen in the blood," and the "most common **treatment** for hypopnea" includes CPAP, in which "[t]he air pressure is adjusted so that it is just enough to maintain the oxygen saturation levels in the blood" (emphasis added).

Further support can be found in **Exhibit B**, which is a Wikipedia entry for **Sleep Apnea**. "The standard definition of any apneic event includes a minimum 10 second interval between breaths, with either a neurological arousal (a 3-second or greater shift in EEG frequency, measured at C3, C4, O1, or O2), a blood oxygen desaturation of 3-4% or greater, or both arousal and

desaturation. Sleep apnea is diagnosed with an overnight sleep test called a polysomnogram, or a 'Sleep Study' which is often conducted by a pulmonologist" (emphasis added). "Diagnostic tests include home oximetry ...," which is a non-invasive device allowing the monitoring of the oxygenation of a patient's hemoglobin.

This is confirmed by the statements under "**Laboratory findings**," which states that "[p]olysomnography of sleep apnea shows pauses in breathing that are followed by drops in blood oxygen and increases in blood carbon dioxide. ... Obstructive sleep apnea shows pauses in breathing for at least 10 seconds causing a decrease in blood oxygen and associates with physical attempts to breathe. Hypopneas in adults are defined as a 50% reduction in air flow for more than ten seconds, followed by a 4% desaturation, and/or arousal" (emphasis added).

In OSAS, by far the most common form of sleep apnea, symptoms in some patients include "tissue loss in brain regions that help store memory," and "nearly 20 percent smaller" mammillary bodies. "One of the key investigators hypothesized that repeated drops in oxygen lead to the brain injury." *See* the last paragraph under "**OSA symptoms, signs and sequelae**."

Oxygen drop is also a defining characteristic in the less common form of sleep apnea "central sleep apnea" and, by definition, "complex apnea." *See* the passages under "**Central sleep apnea**."

As a consequence of needing to control / maintain blood oxygen levels, "[t]he most common **treatment** and arguably the most consistently effective treatment for sleep apnea is the use of a continuous positive airway pressure (CPAP) device" (also see above regarding treatment of hypopnea).

In contrast, nowhere in **Exhibit C** – a Wikipedia entry for **Snoring** – is the reference to blood oxygen level drop or hypoxemia. In fact, the entry distinguishes primary snoring from apnea by stating that "[b]esides the 'noise' of snoring, more complex conditions such as sleep apnea can be consistent with the symptom of snoring. A sleep study can identify such issues." Not surprisingly, "[a]lmost all treatments for snoring revolve around clearing the blockage in the breathing passage. This is the reason snorers are advised to lose weight (to stop fat from pressing

on the throat), stop smoking (smoking weakens and clogs the throat) and sleep on their side (to prevent the tongue from blocking the throat)" (emphasis added).

Applicant notes that none of the mentioned treatments involves any effort to increase or maintain blood oxygen levels in snoring patients. In contrast, the most common and the most consistently effective treatment for sleep apnea / hypopnea is CPAP, which **monitors and maintains the oxygen saturation levels in the blood** (*supra*).

These passages are consistent with the notion that hypoxemia or dropped blood oxygen levels is a central defining characteristic of both apnea and hypopnea, while the same is not true for primary snoring.

In other words, these evidence suggest that primary snoring fundamentally differs from severe sleep disorders such as apnea and hypopnea, in that the former is not associated with hypoxemia, while the latter conditions are defined by it. The claims as amended clearly distinguish nocturnal upper airway obstruction that does not result in hypoxemia (primary snoring) from secondary snoring resulting from apnea or hypopnea. Therefore, the claims as amended are not anticipated by Barth.

Claims 1, 5, and 6 are also rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Xiao *et al.* (of record) as evidenced by Gould *et al.* (*The American Review of Respiratory Disease* 137(4), 1988, Abstract only, or "Gould"). The Examiner argues that Xiao teaches the treatment of 18 GERD/OSAS patients having a number of symptoms, including snoring, with cisapride 10 mg tid combined with omeprazole, and that there is a "significant association between GER and partial airway obstruction."

As argued above, the claims as amended do not read on treating any patients having partial nocturnal upper airway obstruction that does not result in hypoxemia.

In contrast, all patients treated in Xiao have GER and OSAS ("... was given patients with GERD and OSAS," "... simple and effective method on GER with OSAS"), seven of which have confirmed "severe GER." Xiao is completely silent about the treatment of snoring patients without OSAS or GER. Thus Xiao cannot anticipate the presently claimed invention.

Just to clarify the record, Applicant respectfully disagrees with the Examiner's statement that "Xiao *et al.* disclose that there is a significant association between GER and partial airway obstruction" (emphasis added). There is simply no reference in Xiao about "partial airway obstruction." Hypopnea may in some situation be considered a form of "partial airway obstruction." However, "a significant association between GER and ... apnea/hypopnea" cannot be automatically extended to all forms of "partial airway obstruction."

In view of the above, neither Barth nor Xiao anticipates the presently claimed invention. Reconsideration and withdrawal of the rejection under 35 U.S.C. § 102 are respectfully requested.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 8, 9, and 11 are rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Xiao (of record) as evidenced by Gould (of record) and in view of Hunt (*Archives of Internal Medicine* 159(7): 649-657, 1999, or "Hunt"). This is a new ground of rejection allegedly necessitated by Applicant's amendment filed on August 20, 2007, although this rejection was not advanced in the previous Office Action mailed on January 14, 2008.

The Office Action argues that Xiao teaches "a significant association between GER and hypopnea, and also teach treating patients suffering from GERD and who snore by administering omeprazole." The Office Action acknowledges that Xiao fails to teach treating the same patients with lansoprazole. The Office Action then argues that Hunt teaches that omeprazole and lansoprazole are all proton pump inhibitors (PPI's) that are effective in the treatment of GERD.

Based on these findings, the Office Action concludes that it would have been *prima facie* obvious to replace omeprazole with lansoprazole in Xiao for the treatment of patients suffering from GERD and snoring.

Applicant respectfully disagrees in view of the claim amendment and arguments above. Applicant submits that Xiao is completely silent about the treatment of snoring or nocturnal upper airway obstruction that does not result in hypoxemia in the patient, and none of the other cited references make up this deficiency. Therefore, the combined teaching of the cited references still fails to disclose all the limitation of the claims.

Therefore, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

CONCLUSION

In view of the above amendments, Applicant believes the pending application is in condition for allowance. Applicant believes no fee other than those authorized in the accompanying Fee Transmittal is due with this response. However, if any other fee is due, please charge our Deposit Account No. **18-1945**, from which the undersigned is authorized to draw under Order No. **SOHN-P01-001**.

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Respectfully submitted,

By_____

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